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| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | EXAMINER AFTERGUT, JEFF H | |
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DOMINIQUE LOUBINOUX

Appeal 2009-012428
Application 10/068857
Technology Center 1700

Decided: April 22, 2010

Before BRADLEY R. GARRIS, CHUNG K. PAK, and
MARK NAGUMO, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 30-31, 44, 47, 52, and 54-59. We have jurisdiction under 35 U.S.C. § 6.

We AFFIRM.

Appellant claims a method of manufacturing a composite sheet comprising providing a first bundle of parallel threads, a lap of threads, and a second bundle of parallel threads including filaments of thermoplastic material, wherein the first bundle, the lap of threads, and the second bundle respectively form first, second, and third layers whose threads are separate and unconnected from threads in any other layer (claim 30).

Further details of Appellant's claimed invention are set forth in representative claim 30 which reads as follows:

30. A method of manufacturing a composite sheet comprising:

providing a first bundle of parallel threads moving unidirectionally in a first direction;

placing a lap of thread(s) on a surface of the moving bundle of threads with a weft insertion carriage, wherein the lap of thread(s) is a single layer of continuous thread(s) oriented in a second direction that is transverse to the first direction, to provide a first combination of threads having a first layer comprising the moving bundle of threads and a second layer comprising the lap of thread(s);

combining the first combination of threads with a second bundle of parallel threads moving in the first direction to provide a second combination of threads having, in the following order, a first layer comprising the moving bundle of threads, a second layer comprising the lap of thread(s) and a third layer comprising the second bundle of parallel threads, wherein the threads of the first layer, second layer, and third layer are separate and unconnected from threads in any other layer,

wherein the second combination of threads comprises at least 50% by weight of co-blended threads consisting essentially of intimately mixed glass filaments and filaments of at least one thermoplastic organic material; then

heating the second combination of threads, optionally applying pressure to the second combination of threads, and cooling the second combination of threads to provide a solid composite sheet; and

collecting the solid composite sheet,

wherein at least one of the first bundle of parallel threads, the second bundle of parallel threads, or the lap of threads comprises the at least one thermoplastic organic material, and at least one reinforcing material, and at least one of the first bundle of parallel threads, the second bundle of parallel threads, or the lap of threads comprises at least two materials having different melting points,

wherein the combination of threads comprises at least 10 percent of the thermoplastic organic material, and

wherein the composite sheet comprises solely the first bundle of parallel threads, the lap of threads, and the second bundle of parallel threads.

The references set forth below are relied upon by the Examiner as evidence of obviousness:

| | | |
|-----------|--------------|---------------|
| Curzio | 4,539,249 | Sep. 03, 1985 |
| O'Connor | 4,800,113 | Jan. 24, 1989 |
| Middelman | 5,269,863 | Dec. 14, 1993 |
| Vane | 5,445,693 | Aug. 29, 1995 |
| Matsuo | 5,989,710 | Nov. 23, 1999 |
| Senoir | GB 2190041 A | Nov. 11, 1987 |

Solventless Fabrication of Reinforced Composites, NASA Tech Briefs 98 (1982) (hereafter "NASA Tech Briefs").

The Examiner rejects all appealed claims under 35 U.S.C. § 103(a) as being unpatentable over Middelman in view of any one of O'Connor, Nasa Tech Briefs, GB '041, or Curzio and optionally further taken with either Vane or Matsuo.

The Examiner acknowledges that in Middelman's process the composite sheet layers (i.e., which correspond to Appellant's claimed first bundle of parallel threads and a lap of threads) are impregnated and

reinforced with a matrix material such as a thermoplastic melt rather than a second bundle of parallel threads which include thermoplastic filaments as required by claim 30 (Ans. 5-10). According to the Examiner, each of O'Connor, NASA Tech Briefs, GB '041, and Curzio teaches that it is advantageous to replace a thermoplastic melt with thermoplastic fibers which are ultimately heated and melted in order to reinforce composite layers (*id.*). The Examiner concludes that it would have been obvious to replace the thermoplastic melt of Middelman's process with thermoplastic fibers as required by claim 30 so as to thereby obtain the advantages taught by O'Connor, NASA Tech Briefs, GB '041, or Curzio (*id.*).

Appellant argues that the Examiner's proposed modification of Middelman "would change the principle of operation of the Middelman process and render the Middelman process inoperable because omission of the Middelman impregnation step would provide an assembly of threads without any matrix structure" (App. Br. para. bridging 6-7).

This argument is unpersuasive for the reasons expressed in the Answer (Ans. 10-13) and below.

Contrary to Appellant's argument, the Examiner's proposed modification of the Middelman process would not result in "an assembly of threads without any matrix structure" (App. Br. para. bridging 6-7). In the conclusion of obviousness, the Examiner proposes replacing Middelman's step of thermoplastic melt impregnation with the step of providing thermoplastic fibers which are ultimately heated and melted in order to obtain the matrix structure which reinforces the layers of Middelman's composite. Therefore, the modification proposed by the Examiner results in the omission of Middelman's impregnation step but not the omission of a

matrix structure as Appellant believes. Rather, the modified Middelman process achieves a matrix structure by using thermoplastic fibers instead of a thermoplastic melt in order to obtain the advantages taught by O'Connor, NASA Tech Briefs, GB '041, or Curzio.

As more fully explained by the Examiner (Ans. 10-13), Appellant also is incorrect in believing that modifying Middelman's process in the manner proposed by the Examiner "would change the principle of operation of the Middelman process" (App. Br. para. bridging 6-7). Since the modified process of Middelman would still achieve a matrix structure for reinforcing the composite layers, no fundamental change would occur in the principle of operation of the Middelman process. In this regard, we emphasize that the advantages of Middelman's process result from the use of thread layers which are not bonded in the form of a woven fabric as in the prior art (*compare* col. 3, ll. 4-39 with col. 1, ll. 29-65). The impregnation step used in Middelman's process was also used in the prior art described by Middelman (*see id.*) and is neither an advantage nor a principle of operation of the Middelman process.

Finally, we observe that the Reply Brief contains arguments based on specific teachings of the secondary references applied by the Examiner (Reply Br. 3-7). These arguments were not, but could have been, made in Appellant's Principal Appeal Brief. Indeed, the Examiner expressly stated that Appellant had failed to address in the Appeal Brief the teachings of the secondary references (Ans. 12, 13). Moreover, Appellant has not explained why these Reply Brief arguments were not presented in the Principal Appeal Brief. Under regulations governing appeals to the Board, any argument not timely presented in the Principal Brief will not be considered when filed in a

Reply Brief, absent a showing of good cause explaining why the argument could not have been presented in the Principal Brief. *See Ex Parte George R. Borden IV*, 2010 WL 191083 *1-5 (BPAI 2010) and *Ex Parte Atsuhisa Nakashima*, 2010 WL 191183 *3-5 (BPAI 2010). Accordingly, we decline to consider these Reply Brief arguments in our disposition of this appeal.

For the reasons set forth above and in the Answer, we sustain the Examiner's § 103 rejection of all appealed claims as being unpatentable over Middelman in view of any one of O'Connor, NASA Tech Briefs, GB '041, or Curzio and optionally further taken with either Vane or Matsuo.

The decision of the Examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a) (2008).

AFFIRMED

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